



FIG. 1.—Entering the decompressor.

## HIGH FLYING AND DECOMPRESSION TREATMENT OF WHOOPING-COUGH

BY

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In 1927 an air pilot of Strasbourg took his child suffering from whooping-cough for a flight to a height of 10,000 feet (3,050 metres). The child's cough was said to have ceased dramatically after three days. Before the war Dr. W. Matter (1946), of Strasbourg, did much pioneer work on aeroplane flights for whooping-cough, and the practice became popular in many countries of Europe and to some extent in South America. As a result of this and of some work done in Switzerland (P. Lauener and E. Maeder, 1942) during the war, several conclusions were reached: (1) that the best results were obtained in the fifth and sixth weeks of the disease; (2) that several flights were no better than one; (3) that an altitude greater than 10,000 feet was rarely necessary; (4) that the extreme cold at this altitude was harmful to some patients, and that for this reason the closed plane was better than the open one.

### Claims for the Treatment

In 1939 a controlled experiment in Berlin on 88 children treated by aeroplane flights and 33 children treated under similar atmospheric pressures in the decompression chamber yielded slightly superior results for the latter, and in addition none were made worse by the decompression treatment. The highest claims made for the treatment about the year 1945 were: approximately 30% cured—that is, cessation of paroxysms within four days; 30% improved—that is, marked diminution of the paroxysms within seven to 10 days; and 40% no change or worse after seven days. At the same time it was generally agreed that the beneficial effect of the treatment depended upon low barometric pressure and low oxygen tension in the alveolar air rather than upon the actual purity of the air breathed. These results were statistically open to considerable criticism owing to the absence of controlled studies and the difficulties of assessment of cure and improvement in out-patients.

In 1946 Baldry and Richou published their first report on 300 cases treated in a decompression chamber in Paris. Selected cases of all ages from 2 months to 40 years were treated, and of those followed up for 21 days (44% of the total) there were 22% of cures in four days, 51% "improved," and 4% whose paroxysms were aggravated for some days after the treatment. Up to 1948 Richou had treated some 6,000 cases in Paris. His published conclusions include the following principles: (1) that the results obtained were independent of age and weight; (2) that the best time for the treatment is after the third week of the disease, preferably the fourth, fifth, or sixth; (3) that repetition of the treatment does not increase the percentage of successes—that is, a good result is obtained with the first treatment or not at all; (4) that contraindications for the treatment are fever, respiratory and cardiac complications, epistaxis and any haemorrhage, nasopharyngeal infections, ear infections, hernia, surgical emphysema, and malnutrition. The rarefied air-pressure is regarded as the chief factor in a beneficial result. How it acts is unknown. It has been suggested that it may lead to a relaxation of bronchial muscle, damping down of the cough reflex, or alteration of the bronchial mucosa in some unknown way.

The method has its severe critics. In 1948 Bergquist treated 45 children in Stockholm—20 by aeroplane at 11,000 feet (3,350 metres) for 45 minutes, and 25 at similar low pressure in a chamber for 45 minutes. He stated that an analysis of the course of the disease, the frequency of paroxysms and vomiting, duration of the disease, bacillary findings, and changes in the blood picture showed no significant difference, and in his opinion flying and low-pressure chambers were completely without value in treatment of whooping-cough.

It is clear that a critical assessment of the treatment is required, preferably in in-patients, with radiological and haematological observations before and after. This is not easy to arrange, and to a large extent it will probably be

FIG. 2.—Inside the decompression chamber. Note the observation windows for use of doctor and technician, the telephone, the thermometer, and oxygen masks (for use in emergency only).



necessary to conduct observations on out-patients. One point that has not been established is the effect of the treatment on the various degrees of pulmonary collapse which so often complicate cases of whooping-cough in the later stages of the disease and which may not be obvious on ordinary physical examination. It is certain, however, that if there are any accompanying acute symptoms such as fever or cyanosis, or any signs of acute bronchitis, the treatment is contraindicated.

### Conclusions

The conclusion at present from the work done is that the treatment is not a cure for whooping-cough in its early stages or for complicated whooping-cough. Its object is to clear up the persistent cough and vomiting of the later stages (e.g., the fourth to seventh weeks) in otherwise uncomplicated cases. Its success has still to be confirmed, and, in any case, seems to be limited. Trials are now proceeding at Park Hospital, where a renovated ex-R.A.F. decompression chamber has recently come into use. Of the 32 cases so far treated at the hospital, reports have been received on 22. In four cases the coughing had virtually ceased within four days and no vomiting occurred after the treatment; three cases were markedly improved, with very little cough and no vomiting seven days after treatment; and in 15 cases there was gradual improvement or no change. In one of the "cured" cases a symptomless right-middle-lobe collapse had completely re-expanded within seven days.

Public transport should not be used for cases of whooping-cough during the infectious stage, which is generally held to include only the first five weeks from onset of the disease, even although cough, whoop, and vomiting continue beyond that time. Applications for treatment should normally be made by doctors to the Emergency Bed Service, 10, Old Jewry, E.C.2 (Tel., Monarch 3000).

### REFERENCES

- Baldry, R., and Richou, M. (1946). *Méd. aéronaut.*, **1**, 512.  
Bergquist, E. V. V. (1948). *Nord. Med.*, **39**, 1459.  
Lauener, P., and Maeder, E. (1942). *Schweiz. med. Wschr.*, **72**, 819.  
Matter, W. (1946). *Méd. aéronaut.*, **1**, 498.

## COMMONWEALTH AND EMPIRE TUBERCULOSIS CONFERENCE

### PROBLEMS OF RESETTLEMENT

The main sessions of the second Commonwealth and Empire Health and Tuberculosis Conference were reported in the *Journal* of July 16 (p. 150). One of the closing sessions was devoted to psychological and social readaptation.

Dr. W. E. CHIESMAN (Medical Adviser to the Treasury) spoke of the difficulties which attended re-employment. In a group like the Civil Service such cases were numbered in hundreds. In 1948, with a working population of 300,000, there were between 500 and 600 primary and relapsed cases of tuberculosis. He had been surprised to find the difference of opinion which existed about the length of time for which a patient required treatment. Sometimes a man was discharged from hospital and told he could return to work almost immediately, while the man's own doctor recommended another six months' convalescence. The criteria of fitness to return to work needed clarification. Another point was that the returned patient might have a certain effect on his fellow workers. General propaganda had developed a fear of tuberculosis and an awareness of the disease, and it was natural that both employers and fellow-employees should desire reassurance. A satisfactory answer to these questions would clear up some of the main difficulties of rehabilitation. It was surely not unreasonable to employ persons whom the chest physician considered to be safe, but the follow-up ought to be improved by asking the patient to get an assurance from his doctor at regular intervals that he was not a potential danger to his associates. If there was a risk from tuberculous patients let it be assessed as accurately as possible, because the future policy for the re-employment of these people must depend upon striking a proper balance between what was good for the patient and what was safe for the community.

A number of industrialists and trade union leaders took part in the discussion on this subject. A description of work in a rheumatic unit was given by Dr. J. F. BACH (St. Stephen's Hospital, London), who said, incidentally, that he believed that happy and contented people did not develop rheumatoid arthritis. Chronic anxiety and shock immediately preceded the onset so often that he felt these must be trigger factors. In his clinic patients were selected for in-patient treatment according to the assessment of personality rather than according to the degree of joint deformity.

Dr. LEWIS MOORMAN (Oklahoma State Medical Association) discussed the psychology of the doctor-patient relationship in the readaptation to industry of sufferers from chronic disease. All good doctors who managed cases of tuberculosis became good psychologists and psychiatrists. A physician should always impress on his patient the importance of the partnership between patient and doctor in the difficult task of getting well.

Dr. TREVOR LLOYD DAVIES (Boots Pure Drug Company) said that the great difficulty about special centres for rehabilitation was that it was impossible to re-create the social relationship as it existed in normal industry. He realized that it was necessary to have these centres in order to get the patient back to industry, but at the very earliest opportunity the patient should return to normal industry. Something to the same effect was said by Miss OLWEN TAYLOR DAVIES, welfare liaison officer at Papworth Village Settlement. All the schemes developed under the Disabled Persons Employment Act, as well as voluntary schemes, she said, were satisfactory only in so far as they restored the individual to economic independence and a normal life. The segregation of unfit workers was not likely to lead to complete readaptation. Experience at Papworth had shown that the patients most easily lost their sense of inferiority when working with fit people.

### Infected Milk

At the final session of the Conference Dr. EDITH SUMMER-SKILL, M.P., Parliamentary Secretary to the Ministry of Food, said no Government could ignore the danger to the health of the community arising from infected milk. The ultimate objective was to secure that all milk sold for domestic consumption should be in closed containers, fitted with overlapping caps to prevent the contamination of the mouth of the bottle, and that the milk should be tuberculin-tested, pasteurized, or sterilized. Unfortunately, this new policy could not be applied immediately to the country as a whole because of insufficiency of pasteurizing and bottling plants. The makers of these plants were so inundated with orders that it would take a long time to complete them. It was therefore proposed to apply the restrictions first to groups of large urban areas, and then to extend them so far as practicable to rural areas. It was probable that some twelve months would elapse before any area would be specified for this purpose, but it was hoped to complete the specifying of all urban areas within five years and most, if not all, of the rural areas within ten years.

Mr. J. N. RITCHIE (Ministry of Agriculture and Fisheries) said that at the end of May last there were 39,997 attested herds, but progress was not equal throughout the country, and the greatest progress was not necessarily attained where the incidence was originally low. The number of cattle in tubercle-free herds (attested and T.T.) in Great Britain was approximately 1,780,000. The sale of tubercle-free milk to Milk Marketing Boards for the year ended March 31, 1948, was 354 million gallons, compared with 141.6 million gallons for the year ended March 31, 1943.

According to a report in the *News Chronicle* (July 1), the health committee of the Marylebone Metropolitan Borough Council has decided to press for revision of the exemption of Government departments and Crown properties from inspection by officers of a local authority. The medical officer of health is said to have been denied access to inspect staff canteens in Government departments.